Markedly increased vitamin B12 concentration
due to immunological interference

Élévation marquée de la vitamine B12
due à une interférence immunologique

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Presence of high serum cobalamin concentrations is generally detected in patients with hematologic disorders and hepatic diseases [1], but only seldom will it be detected in patients without evidence of cobalamin metabolism disturbance [2]. We report a case in which an analytical problem led to a falsely increased result.

In April 2012, an 85 year old man presented to his general practitioner for a routine check-up. He was a known case of chronic kidney disease V, type 2 diabetes and Parkinson disease. Laboratory findings were as follows: hemoglobin 11.9 g/dL (range=12-16 g/dL), mean red cell volume (MCV) 98 fL (range=82-98 fL), creatinine 400 μmol/L. In view of these findings serum vitamin B12 and folate were measured by Roche Elecsys 2010 immunoassay analyser and found to be >2000 pg/mL (range=197-866 pg/mL) and 6.1 ng/mL (range=4.6-34.8 ng/mL) respectively. A liver profile showed results within the reference ranges. Although, the patient was not receiving known interfering medication, he had a history of vitamin B12 therapy. Two and eight-fold dilution tests with an assay diluent gave: 3986 and 7056 pg/mL respectively. After treatment with polyethylene glycol 12% (PEG 8000) serum B12 fell to 540 pg/mL. Test for intrinsic factor, parietal cell antibodies were negative.

We hypothesise that the pre-treatment step failed to dissociate all vitamin B12 from binding proteins. The explanation for this phenomenon is a dramatically high serum vitamin B12-binding capacity, caused by immunoglobulin-transcobalamin-vitamin B12 complexes [3, 4]. Although the PEG precipitation test showed this analytical interference, transcobalamin decreased clearance in chronic kidney disease may also give elevated vitamin B12 levels [5]. Functional vitamin B12 deficiency could not be ruled out as serum homocystein and serum methylmalonic acid are both decreased in chronic kidney disease. Given our patient borderline hematologic results, cobalamin supplementation should be discussed.

Conflicts of interests: none.

References


